



FCI/GB 2003 / 0 0 4 1 5 9

MAR 2007

10/528209

INVESTOR IN PEOPLE

The Patent Office  
Concept House  
Cardiff Road  
Newport  
South Wales  
NP10 8QQ

REC'D 18 NOV 2003

WIPO

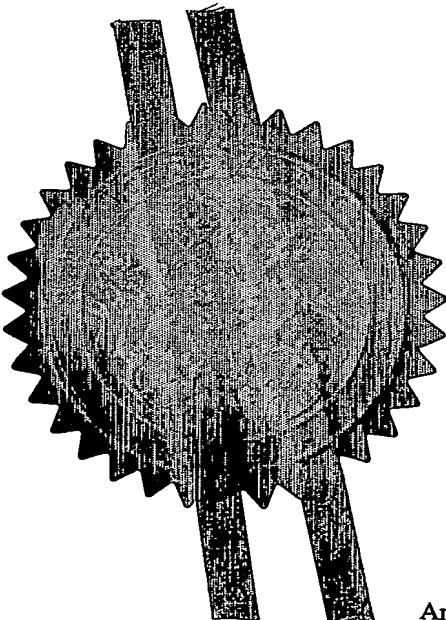
PCT

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.



Signed

*H. Behen*

Dated 10 November 2003

**PRIORITY  
DOCUMENT**

SUBMITTED OR TRANSMITTED IN  
COMPLIANCE WITH RULE 17.1(a) OR (b)

An Executive Agency of the Department of Trade and Industry

**BEST AVAILABLE COPY**

(16)

THE PATENT OFFICE  
A  
25 SEP 2002

The  
Patent  
Office

1/77

## Request for grant of a patent

The Patent Office

Cardiff Road  
Newport  
Gwent NP9 1RH

1. Your reference P32232/JED/JAL

2. Patent Application Number  
(the Patent Office will fill in this part) 0222203.2

3. Full name, address and postcode of the or of each applicant (*underline all surnames*)  
Formosa Estates Limited  
109 Queen Street  
Peterhead  
Aberdeenshire  
AB42 1UA  
25SEP02 E750772-2 D02884  
P01/7700 0.00-0222203.2

Patents ADP number (*if you know it*)

If the applicant is a corporate body, give the country/state of its incorporation

United Kingdom

7470635001

Title of the invention "Apparatus"

Name of your agent (*if you have one*) Murgitroyd & Company

"Address for service" in the United Kingdom to which all correspondence should be sent (*including the postcode*)

165 - 169 Scotland Street  
Glasgow  
G5 8PL

Patents ADP number (*if you know it*)

1198015

If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (*if you know it*) the or each application number

Country

Priority application number  
(*if you know it*)

Date of filing  
(day / month / year)

If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
(day / month / year)

Is a statement of inventorship and of right to grant a patent required in support of this request? (*Answer 'Yes' if:*

Yes

- a) any applicant named in part 3 is not an inventor, or  
b) there is an inventor who is not named as an applicant, or  
c) any named applicant is a corporate body.  
See note (d))

**Patents Form 1/77**

9. Enter the number of sheets for any of the following items you are filing with this form.  
Do not count copies of the same document

Continuation sheets of this form -

Description 12

Claim(s) -

Abstract -

Drawing(s) 16 + 1

10. If you are also filing any of the following,  
State how many against each item.

Priority documents -

Translations of priority documents -

Statement of inventorship and right  
to grant of a patent -

Request for preliminary examination  
and search (Patents Form 9/77) -

Request for substantive examination  
(Patents Form 10/77) -

Any other document  
(please specify) -

11. I/We request the grant of a patent on the basis of this application

Signature *MURGITROYD* Date 24/09/02  
MURGITROYD & COMPANY

12. Name and daytime telephone number of  
person to contact in the United Kingdom Jamie Allan 01224 706616

**Warning**

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

**Notes**

- If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
- Write your answers in capital letters using black ink or you may type them.
- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- Once you have filled in the form you must remember to sign and date it.
- For details of the fee and ways to pay please contact the Patent Office.

1     "Apparatus"

2

3     This invention relates to restraining apparatus, and  
4     especially but not exclusively, to apparatus for  
5     securing children.

6

7     It is often difficult to control a group of children  
8     and to keep them safe in the group, particularly  
9     when taking them for walks or excursions.

10

11     According to the present invention there is provided  
12     restraining apparatus for coupling two or more users  
13     comprising at least one spine member with at least  
14     two lateral attachment members for coupling the  
15     users to the spine member.

16

17     The spine member can be an elongate rod or plate  
18     from which the lateral attachment members extend  
19     sideways. The rod or plate is typically  
20     inextensible along its axis but preferably has some  
21     lateral resilience, so that it can bend sideways  
22     with the movement of the users. Lateral resilience

1 in only one plane (i.e. the horizontal plane in use  
2 of the device) is preferable to lateral resilience  
3 in more than one plane (e.g. vertical and horizontal  
4 planes) because rigidity in the vertical plane with  
5 respect to the user has the benefit that parts of  
6 the spine member have a reduced tendency to sag and  
7 become trampled underfoot.

8  
9 In some embodiments the spine member is  
10 compressible. Plastics material is suitable for the  
11 spine members. Optionally, at least a part of the  
12 spine member is made of corrugated plastic.  
13 Alternatively, the spine member is made of composite  
14 plastics material or rubber. The spine may have a  
15 stiffening metal member covered with the plastics or  
16 rubber material.

17  
18 The spine being flexible and/or compressible allows  
19 the users to approach each other and to turn  
20 corners.

21  
22 Preferably, the attachment members are releasably  
23 coupled to the spine member at nodes on the spine  
24 member. Preferably, each node has two attachment  
25 members.

26  
27 The attachment members are typically arms. The arms  
28 may be laterally flexible and/or axially extensible  
29 and/or compressible, to absorb sudden forces. In  
30 some embodiments they can be rigid or semi-rigid, or  
31 preferably non-flexible in some planes but flexible  
32 in others.

1 Typically, the attachment members are pivotable with  
2 respect to the spine member. Optionally, each  
3 attachment member at each node is pivotable with  
4 respect to the other attachment member. In  
5 preferred embodiments, each node has a pair of  
6 attachment members extending laterally from opposite  
7 sides of the spine member. It is not necessary to  
8 have an attachment member extending from each side  
9 of each node; a single node can instead bear a  
10 single attachment member. Attachment members can  
11 all extend from the same side of the spine member,  
12 or from different sides. In one optional  
13 embodiment, members are staggered along the spine  
14 member.

15  
16 Pivotal attachment members allow users of different  
17 heights to share one node.

18  
19 Optionally, two or more spine members are connected  
20 together.

21  
22 This allows a long chain of spine members and nodes  
23 to be built up, which is useful to connect a large  
24 number of users.

25  
26 Preferably, the apparatus also includes harnesses to  
27 be worn by each user. Typically, each harness is  
28 adapted to releasably engage an attachment member,  
29 to attach the user to the spine member. Typically,  
30 the harness includes a belt. Optionally, the  
31 harness includes a shoulder strap. Preferably, each  
32 harness has at least one socket to engage a

1 protrusion on an attachment member. Optionally, the  
2 socket includes a first plate, biased apart from and  
3 pivotable relative to a second plate, and pivoting  
4 moves the ends of the plates at the socket mouth  
5 apart to enlarge the mouth to engage/release an  
6 attachment member. Typically, the plates are biased  
7 apart by a coil spring. Typically, both plates are  
8 pivotable with respect to the socket.

9

10 In another aspect the invention provides a method of  
11 securing or restraining a person, comprising  
12 harnessing the person to a spine member via an  
13 attachment member.

14

15 Typically more than one person is harnessed to the  
16 spine member.

17

18 In some embodiments the spine and/or the harness can  
19 be coloured brightly, and/or can incorporate  
20 reflective and/or light emitting devices such as  
21 LEDs and strobes to attract attention.

22

23 An embodiment of the present invention will now be  
24 described by way of example only and with reference  
25 to the following drawings, in which:-

26

27 Fig 1 is a plan view of six children using a  
28 restraining apparatus;

29

30 Fig 2 is a plan view with the children with the  
31 apparatus in a compressed position;

32

1        Fig 3 is a plan view of the children in a  
2        curved configuration;

3  
4        Fig 4 is a front view of a harness worn by each  
5        child;

6        Fig 5 is a front view of the apparatus worn by  
7        two children of different heights;

8  
9        Fig 6 is a perspective view of the apparatus  
10       worn by 2 children;

11  
12       Fig 7 is a perspective view of 3 children  
13       wearing harnesses;

14  
15       Fig 8 is a perspective view of one embodiment  
16       of the apparatus;

17  
18       Fig 9 is a perspective view of an alternative  
19       embodiment of the apparatus;

20  
21       Fig 10 is a perspective view of an alternative  
22       embodiment of the apparatus;

23  
24       Fig 11 is a front view of a child wearing a  
25       harness;

26  
27       Fig 12 is a perspective view with interior  
28       detail of part of the apparatus, showing an arm  
29       located in a socket;

30  
31       Fig 13 is a perspective view of Fig 14 without  
32       the interior detail;



1  
2 Fig 14 is a side view with interior detail of  
3 the arm and socket of Fig 12;

4  
5 Fig 15 is an exploded view of a node, spine  
6 members and attachment means;

7  
8 Fig 16 is a perspective view of the apparatus  
9 of Fig 15 with the node secured to the spine  
10 members;

11  
12 Fig 17 is an exploded view of a node of the  
13 apparatus, spine members and an alternative  
14 attachment means;

15  
16 Fig 18 is a perspective view of the apparatus  
17 of Fig 17 with the node secured to the spine  
18 members; and

19  
20 Fig 19 is a schematic view of different  
21 embodiments of the apparatus.

22  
23 Fig 1 shows six children 12 secured together by  
24 restraining apparatus 10. The apparatus 10 has two  
25 elongate spine members 14, 16. Each node 18, 20, 22  
26 has two lateral arms 24, 26; 28, 30; and 32, 34.

27  
28 The spine members 14, 16 are optionally axially  
29 compressible and/or extensible and/or laterally  
30 flexible in the horizontal plane of the apparatus in  
31 use, to allow the apparatus to bend. This allows  
32 the children 12 to approach each other (fig 2) and

1 turn corners (fig 3). However, the spine members  
2 14, 16 are normally inextensible, or at least only  
3 very slightly axially resilient, so that the  
4 distance between the children cannot increase to any  
5 great extent.

6  
7 Different sizes of apparatus 10 are envisaged,  
8 depending on the number of children to be secured.  
9 To make a larger version of apparatus 10, additional  
10 spine members and nodes can simply be attached to  
11 the apparatus 10.

12  
13 Fig 4 shows a harness 36 which is used to attach the  
14 children 12 to the apparatus 10. The harness 36 has  
15 a shoulder strap 38 and a belt 40. The belt 40 is  
16 fastened by a simple buckle 42. The belt 40 also  
17 has two sockets 44 for engagement with an arm of the  
18 apparatus 10. Sockets 44 can slide on rails 46  
19 provided in the belt, so that the child can turn  
20 sideways with respect to the spine 14, 16. The  
21 sockets 44 can typically be switched between a first  
22 configuration where they are fixed immovably to the  
23 rails 46, and a second configuration in which they  
24 can slide relative to the rails 46.

25  
26 Fig 5 shows two different-sized children 12 secured  
27 to node 22 by arms 32, 34. Each user 12 is wearing  
28 a harness 36, and a socket 44 in each harness 36 is  
29 engaged with an arm 32, 34 of the node 22. The arms  
30 32, 34 are pivotable with respect to the node 22, to  
31 allow the different-sized children 12 to be

1 connected to the apparatus 10 without twisting the  
2 apparatus 10.

3

4 The arms 32, 34 can also be axially and laterally  
5 resilient so as to resist the transfer of forces  
6 between the children connected to the node 22.

7

8 Figs 6, 7 and 11 show children wearing harnesses 36  
9 and attached to apparatus 10 (Fig 6) and without the  
10 apparatus (Figs 7 and 11).

11

12 Fig 8 shows an embodiment of apparatus 10, having  
13 spine members 60 connected to each other by single  
14 pivot nodes 54. The spine members are typically  
15 made of aluminium covered with a non-pvc rubber.  
16 The spine members 60 are typically in the form of  
17 thin sheets of plastic material, orientated so that  
18 in use the sheets lie in the vertical plane. This  
19 allows lateral but not vertical flexibility of the  
20 spine members.

21

22 Each node 54 consists of a ring 56 and a rod 58,  
23 which passes through the centre of the ring 56 in a  
24 direction parallel to the axis of the spine members  
25 60. Each pair of arms 62, 64 is typically formed as  
26 a single piece, having a central bore arranged  
27 parallel to the axis of the spine members 60 and  
28 shaped to accommodate the rod 58, which passes  
29 through the bore. Each pair of arms 62, 64 is  
30 pivotal around the rod 58 and is thus pivotable with  
31 respect to the spine members 60, but the arms 62, 64  
32 are not pivotable with respect to each other. The

1 ends of arms 62, 64 have elongate tabs 65 to engage  
2 in the sockets of the harness. Spine members 60  
3 optionally have reflectors 68, which help the  
4 children 12 to be seen in the dark.

5  
6 Fig 9 shows an embodiment very similar to that of  
7 Fig 8, except that the rings 56 of each node 54 are  
8 closed or covered, typically by a rubber or plastics  
9 gaiter. This could help prevent fingers from  
10 becoming trapped in the nodes 54.

11  
12 Fig 10 shows an alternative embodiment of apparatus  
13 110, having spine members 160 which include a  
14 portion of corrugated plastic tubing. The  
15 corrugated tubing allows the spine members 160 to  
16 bend laterally and to be compressed and stretched  
17 axially. The other major difference from the  
18 previous embodiment is that the arms 162, 164 are  
19 pivotable relative to each other, as well as  
20 relative to nodes 154. The arms 162, 164 are also  
21 typically resilient and can be formed from a rubber  
22 material.

23  
24 Figs 12 to 14 show views of arm 62 engaged in socket  
25 44. Inside socket 44 is a grip device 90, which  
26 includes two plates 92, 94, each having an aperture  
27 to receive opposite ends of elongate tab 65 on the  
28 end of the arm 62. The plates 92, 94 are pivotable  
29 about respective pivot points 96, 98 and a coil  
30 spring 93 held in compression between the plates on  
31 one side of the pivot points 96, 98 at the end  
32 furthest from the socket mouth urges the other ends

1 of the plates together to capture the tab 65 in the  
2 apertures. Dual buttons 95, 97 are connected to the  
3 plate ends above and below the spring 93.

4

5 The dual buttons enable release from the apparatus.

6

7 Figs 15 to 18 show details of possible connections  
8 between nodes 54 and spine members 60. Fig 15 is an  
9 exploded view showing spine members 60, the ends of  
10 which terminate in rods that can slide into vertical  
11 slots 72 in nodes 54 and are secured therein by  
12 bolts 74. Bolts 74 fit through a first aperture 76  
13 in one side of ring 56, a corresponding aperture 70  
14 in the end of each spine member 60 and through a  
15 second aperture 76 in ring 56. Fig 16 is a non-  
16 exploded view of Fig 15.

17

18 Fig 17 shows an alternative connection between nodes  
19 54 and spine members 60. Ring 54 has two end lobes  
20 80, which each have a cylindrical lateral protrusion  
21 82 in one side. The protrusions 82 are shaped to  
22 engage apertures 84 in the ends of spine members 60.  
23 Securing caps 86 attach to the protrusions 82 once  
24 they are engaged in apertures 84. The caps 86 are  
25 typically screwed to the protrusions by engaging  
26 interior screw threads of the cap 86 with exterior  
27 screw threads on the protrusion 82, but other  
28 engagement means could also be used. Fig 18 is a  
29 non-exploded view of Fig 17.

30

31 To secure a child to the restraining apparatus 10,  
32 the child 12 puts on a harness 36 and fastens the

1 belt buckle 42. One of the sockets 44 of the  
2 harness 36 is then connected to an arm 24 of the  
3 apparatus 10. This is done by simultaneously  
4 pushing socket buttons 95, 97. This compresses the  
5 spring 93 and pivots the plates 92, 94 so the ends  
6 of the plates 92, 94 at the socket opening move away  
7 from each other. This widens the socket entrance  
8 enough to allow the elongate tab 65 to be inserted.  
9 Once the tab 65 is aligned with the apertures in the  
10 plates 92, 94, the buttons 95, 97 are released,  
11 which moves the plate ends over the tab 65, leaving  
12 the ends of the tab 65 projecting through the  
13 apertures in the plates 92, 94. Thus, the elongate  
14 tab 65 is trapped in the socket 44 and the child 12  
15 is secured to apparatus 10. The procedure is  
16 repeated to secure all the children required to  
17 respective arms of the apparatus 10.

18  
19 To disengage a child 12 from the apparatus 10, the  
20 socket buttons 95, 97, are simultaneously compressed  
21 and held down. This compresses spring 93, and  
22 pivots the plates 92, 94 to widen the socket opening  
23 as before. This releases the tab 65 from the  
24 apertures in the plates 92, 94 and the arm 62 is  
25 then pulled out of the socket 44. The buttons 95,  
26 97 are now released and the child takes off the  
27 harness 36. This procedure is repeated to release  
28 all children 12 from the apparatus 10.

29  
30 Modifications and improvements can be incorporated  
31 without departing from the scope of the invention.  
32 For example, the position of the tabs and sockets

1 could be reversed, i.e. each arm could have a socket  
2 and the harness could have a tab to engage the  
3 socket.

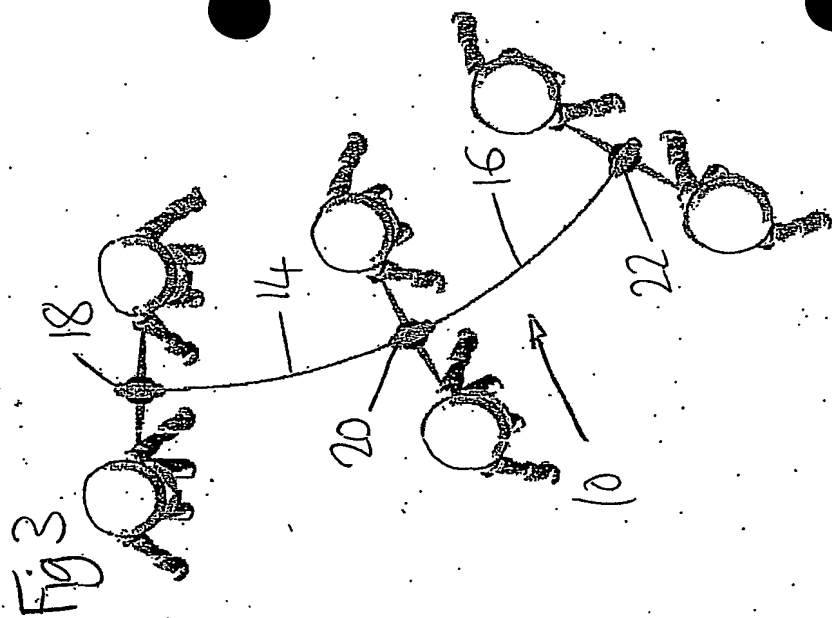
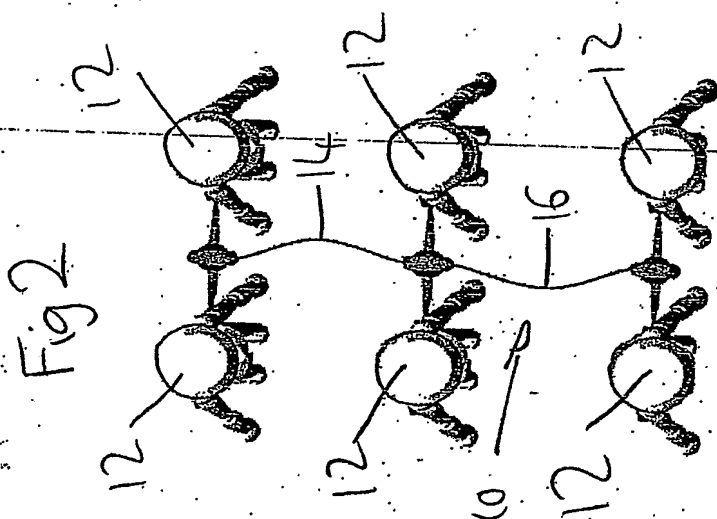
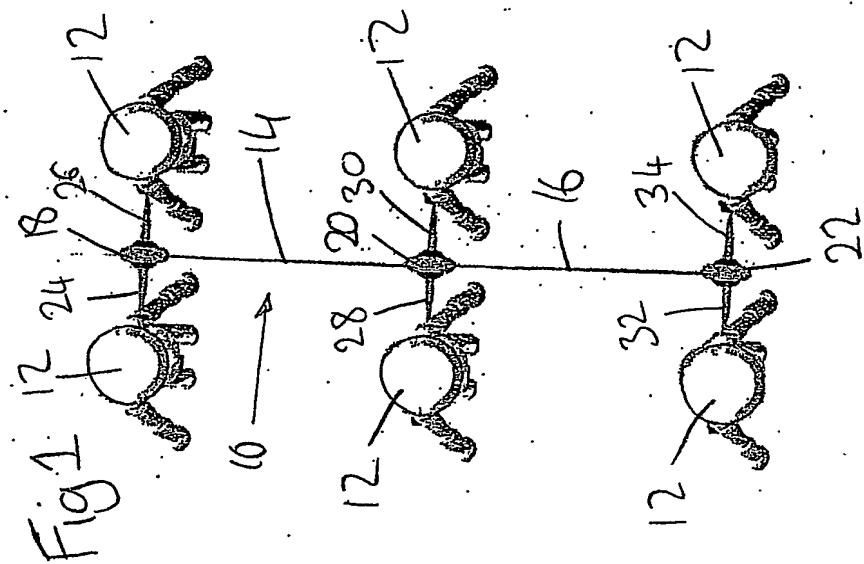
4  
5 The arm and socket do not have to engage by  
6 apertures in plates engaging the arms; any way of  
7 attaching the arm to the socket would be adequate,  
8 e.g. the arm could screw into the socket.

9  
10 The socket could be replaced by a lock mechanism,  
11 requiring a special tool to release the arm, so that  
12 a child secured to the apparatus could not release  
13 itself. This could be advantageous for use with  
14 difficult/problem children.

15  
16 Two sets of apparatus could be used parallel to each  
17 other, with a central column of children attached to  
18 both apparatus. Figure 19 shows a number of  
19 different schematic combinations of children 12,  
20 spines 100 and arms 110. Not all of the nodes need  
21 to be provided with arms at each side, nor do all  
22 the nodes or arms need to be occupied by children.

23  
24 Embodiments of the invention could be created using  
25 a single spine instead of separate spine members and  
26 (thereby removing the need for nodes), and where the  
27 arms extend out through apertures in the spine.

28  
29 The harnesses could be permanently attached to the  
30 apparatus (instead of releasably attached by the arm  
31 and socket connection).





central pivot allows  
different heights of children  
to attach to adjacent arms

Fig 5

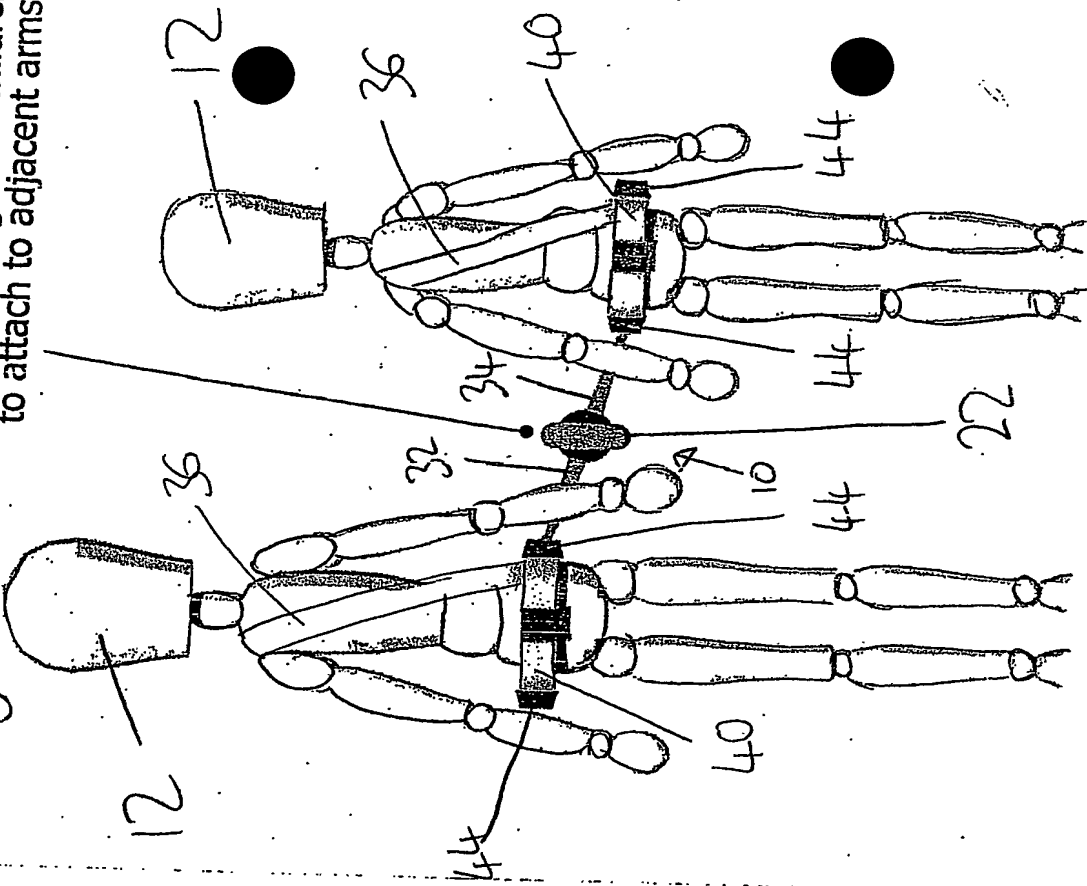


Fig 4

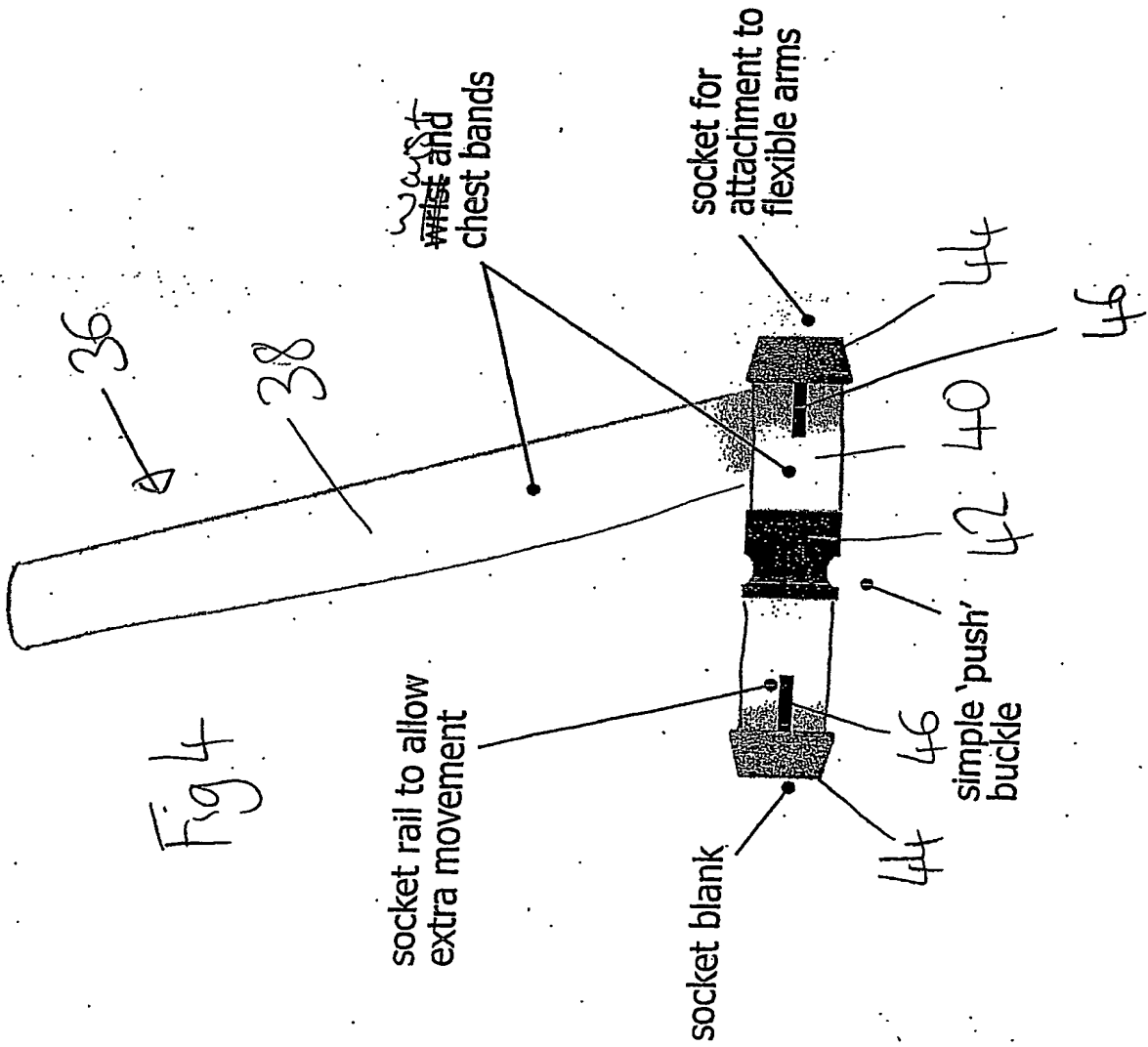


Fig 1

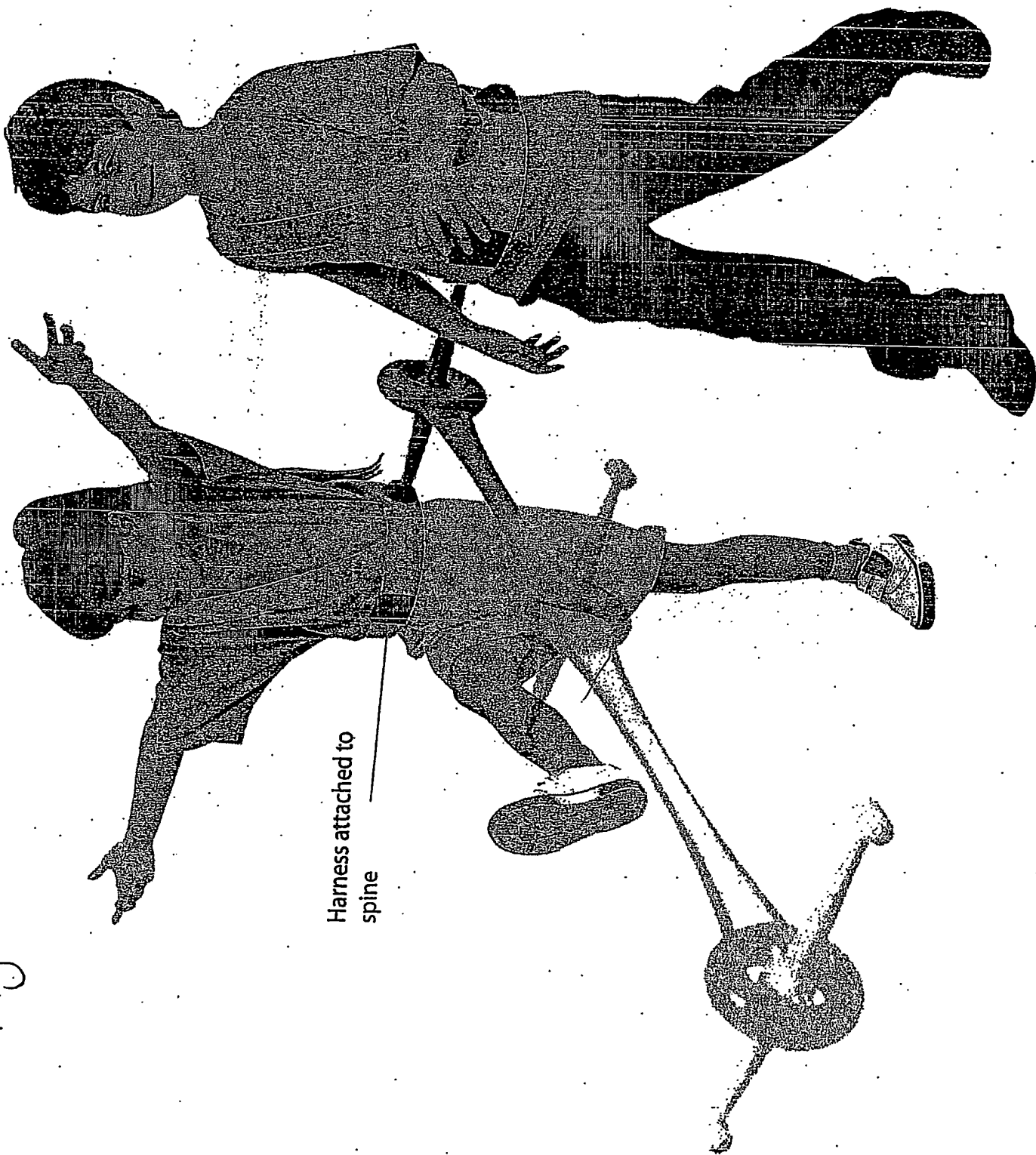
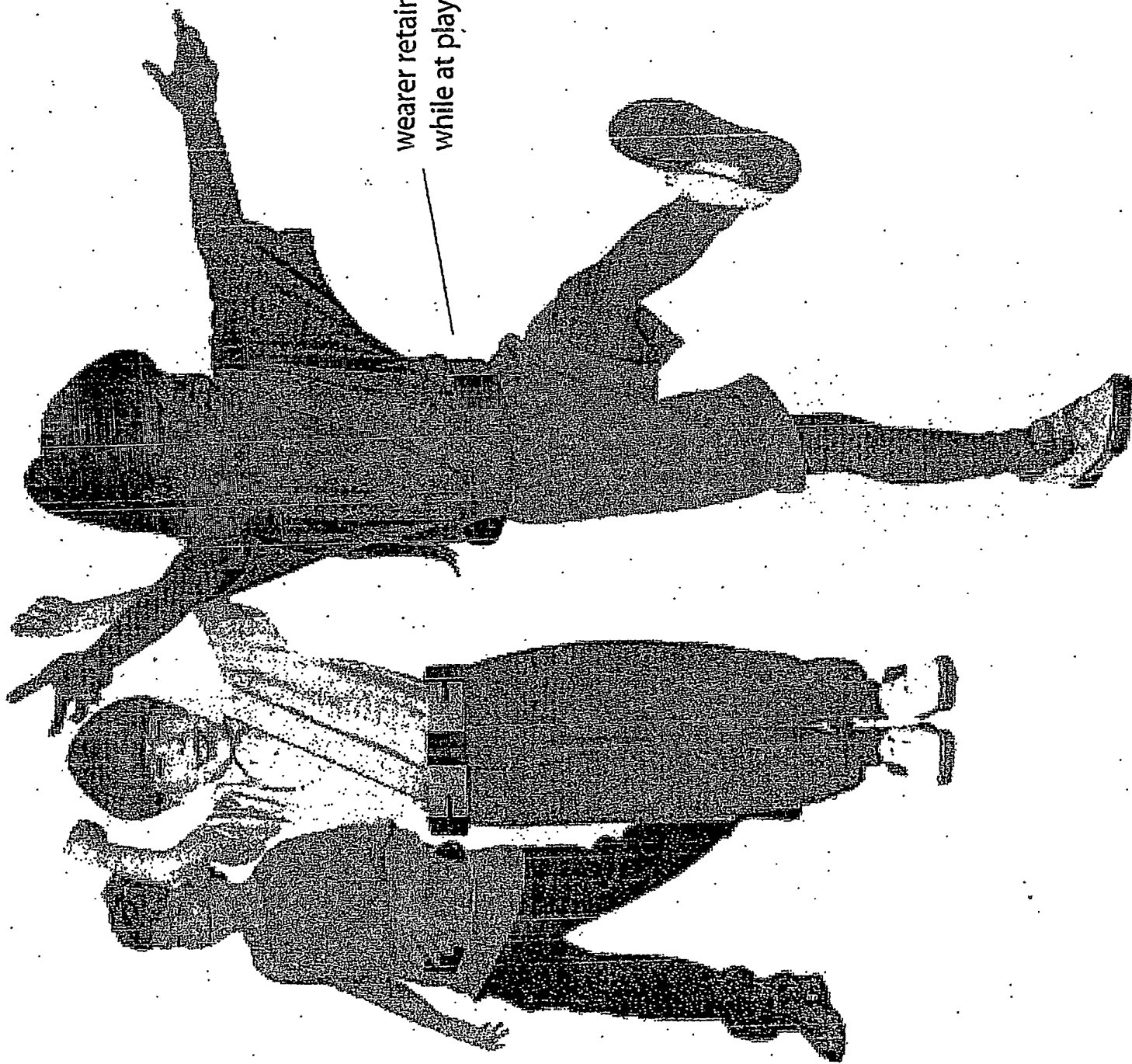
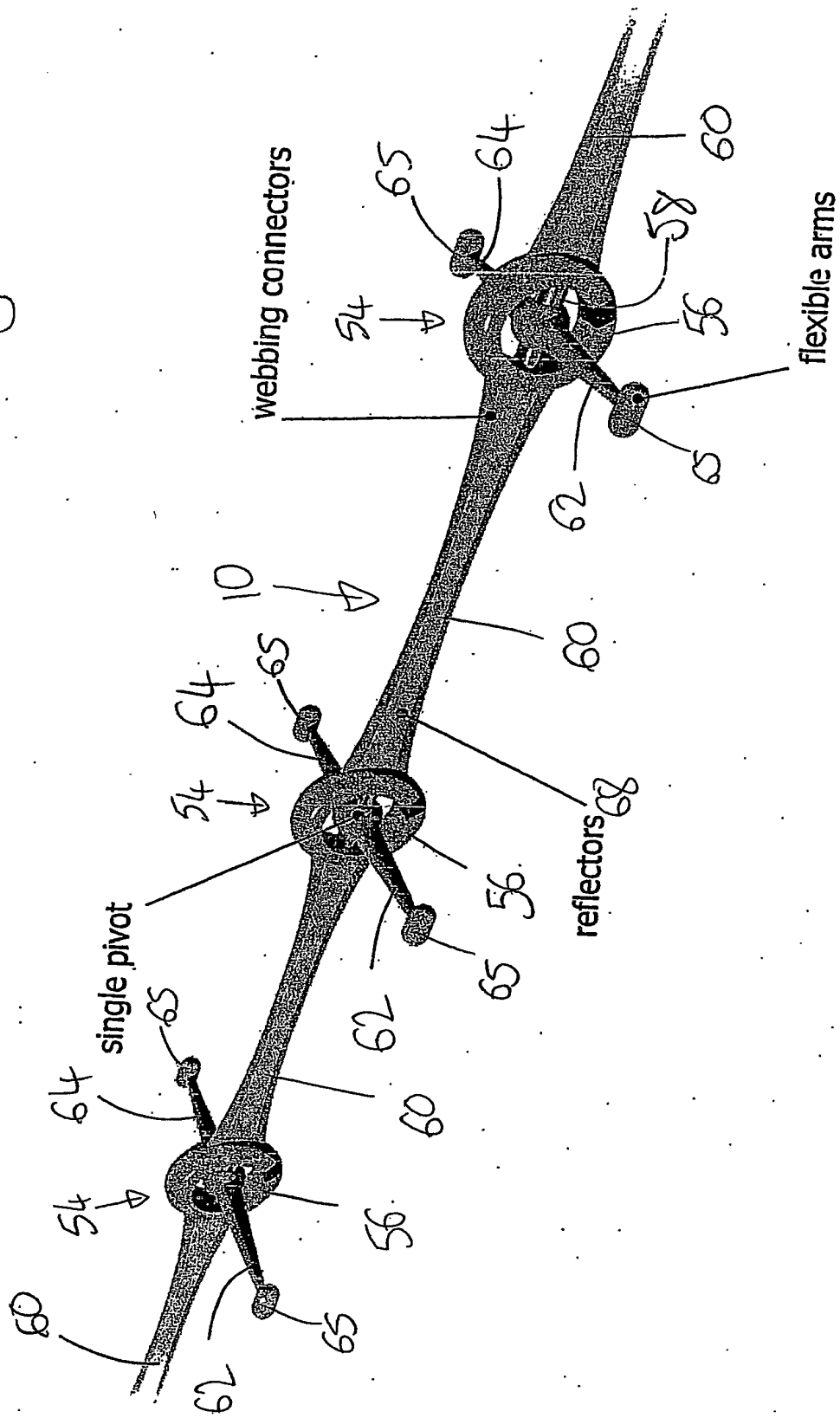


Fig. 1



wearer retains harness  
while at play

Fig 8



9

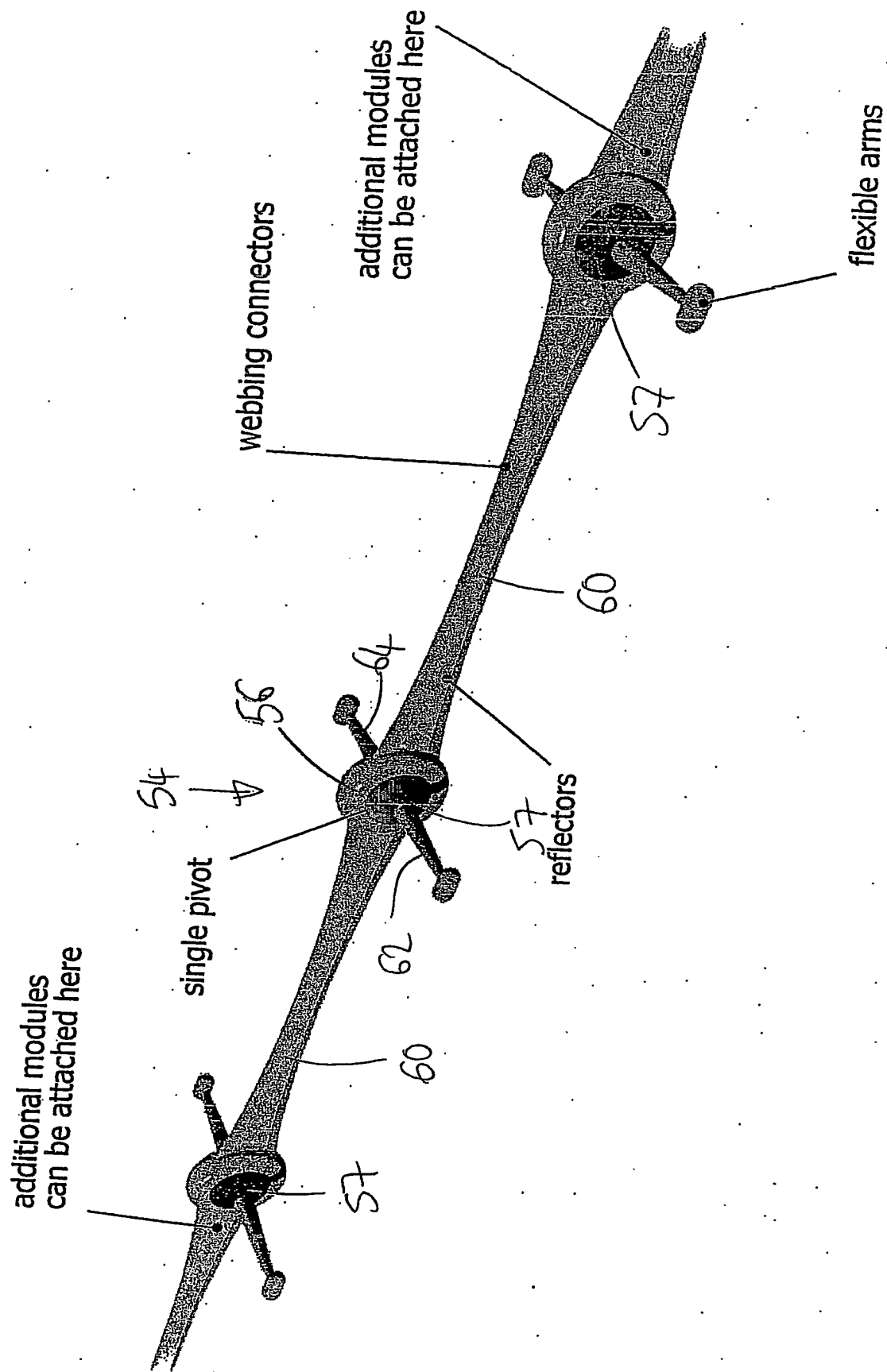


Fig 10

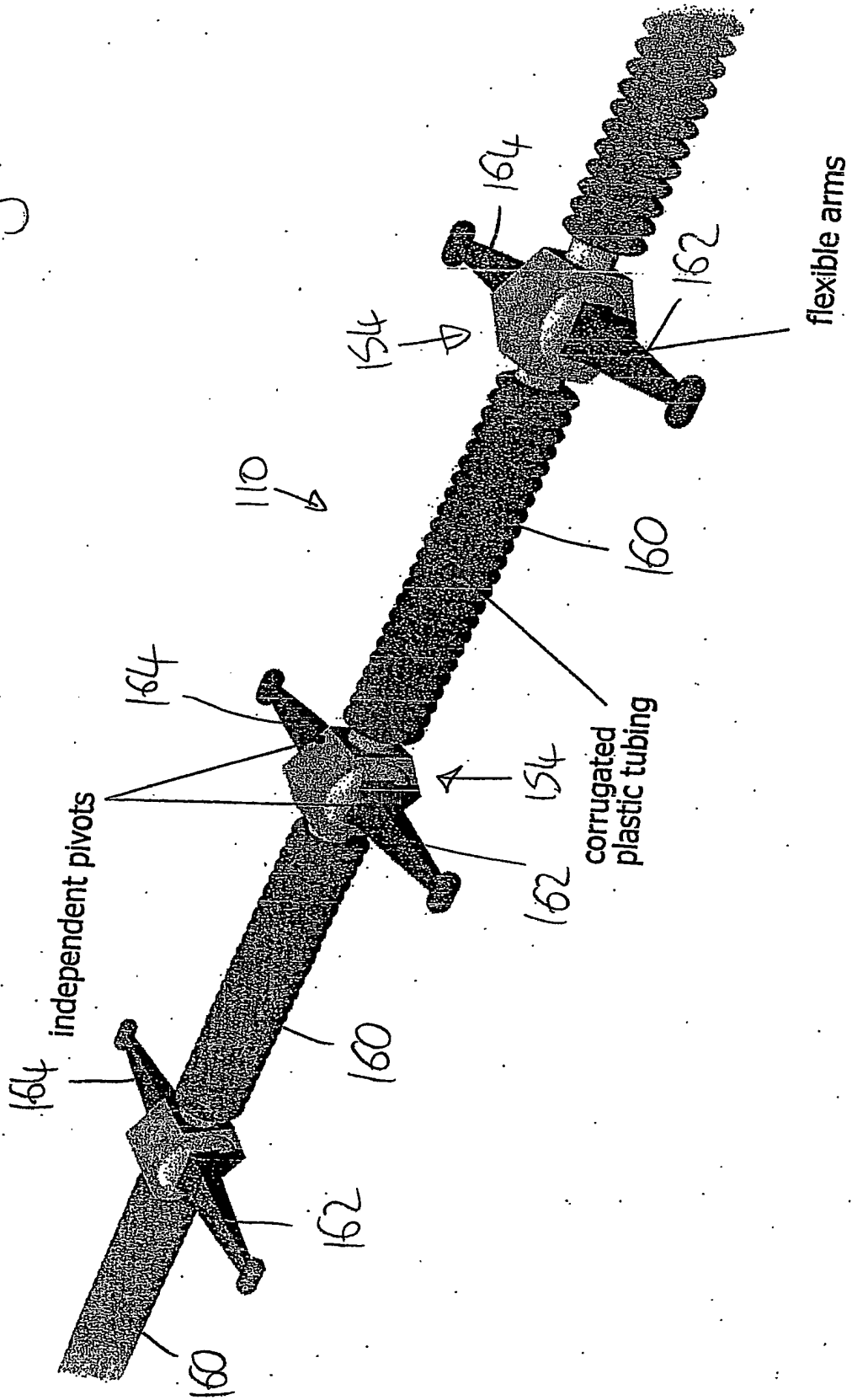


Fig 11

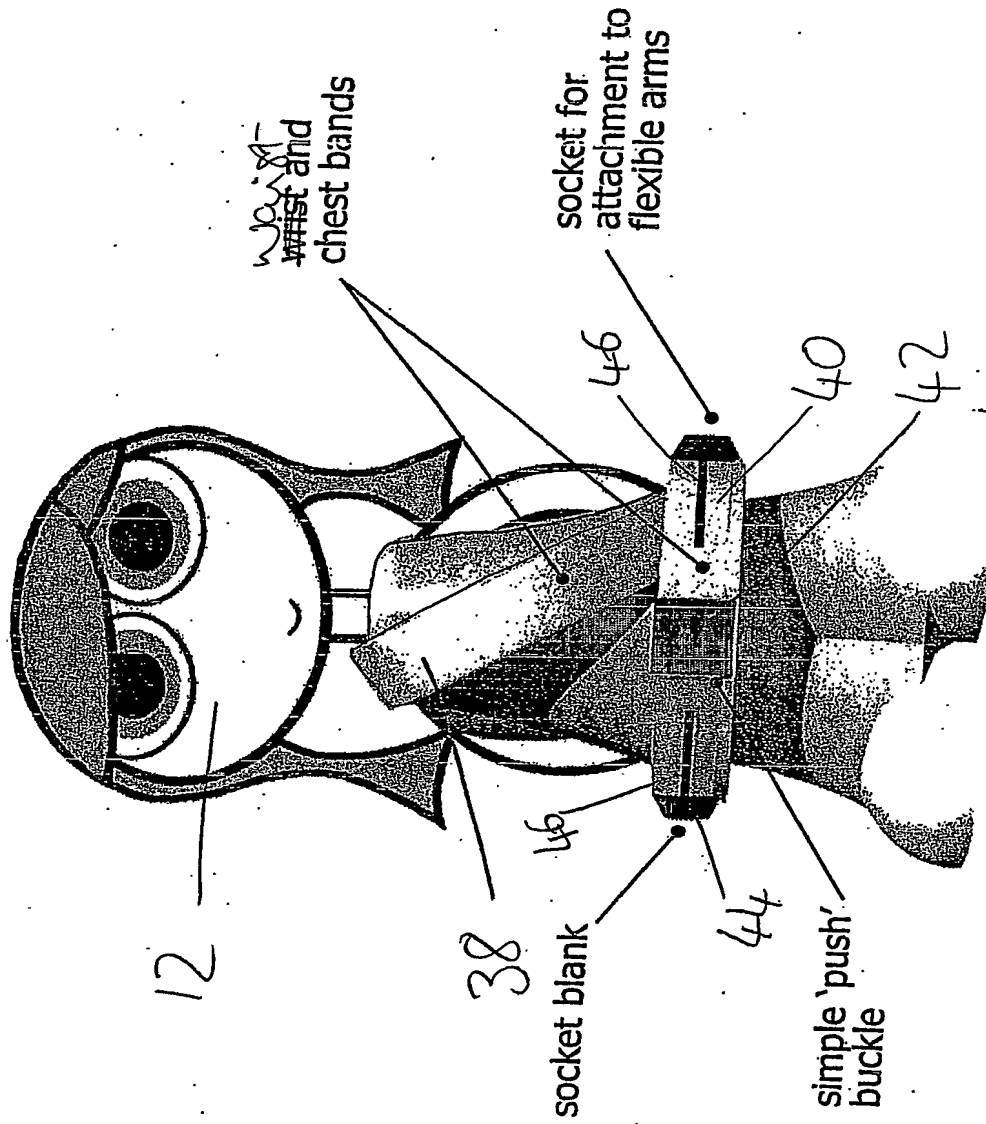


Fig 12

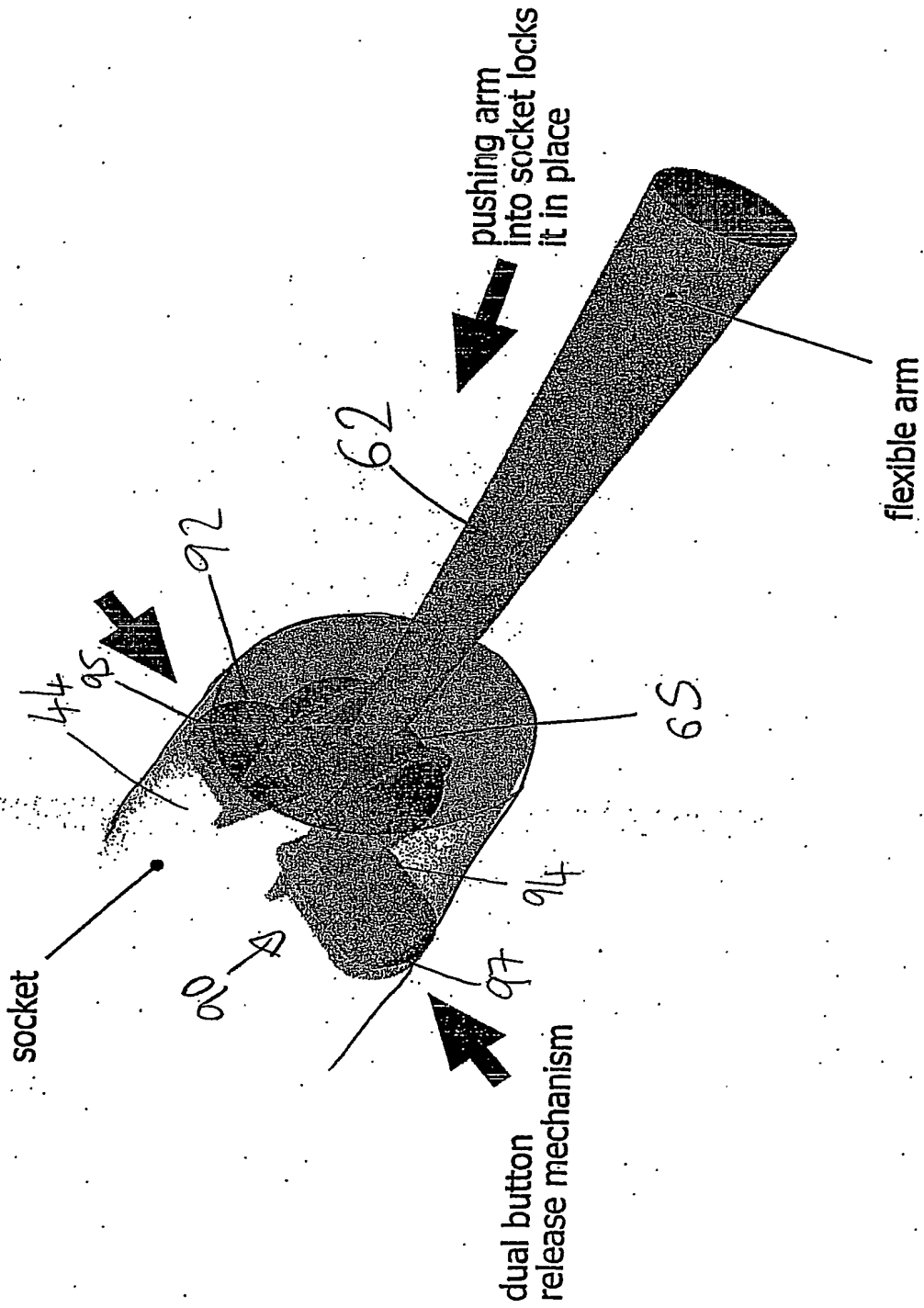




Fig 13

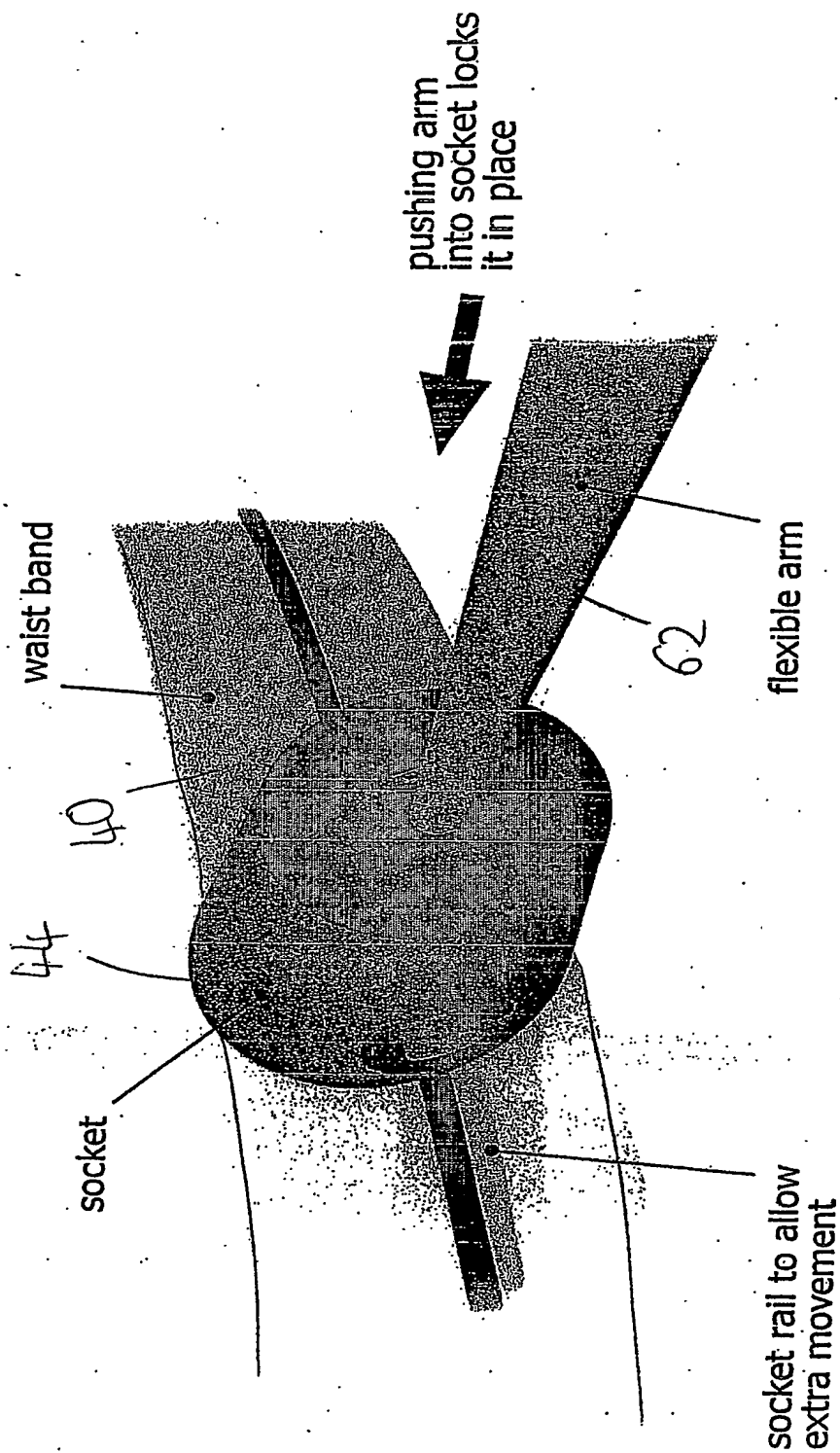
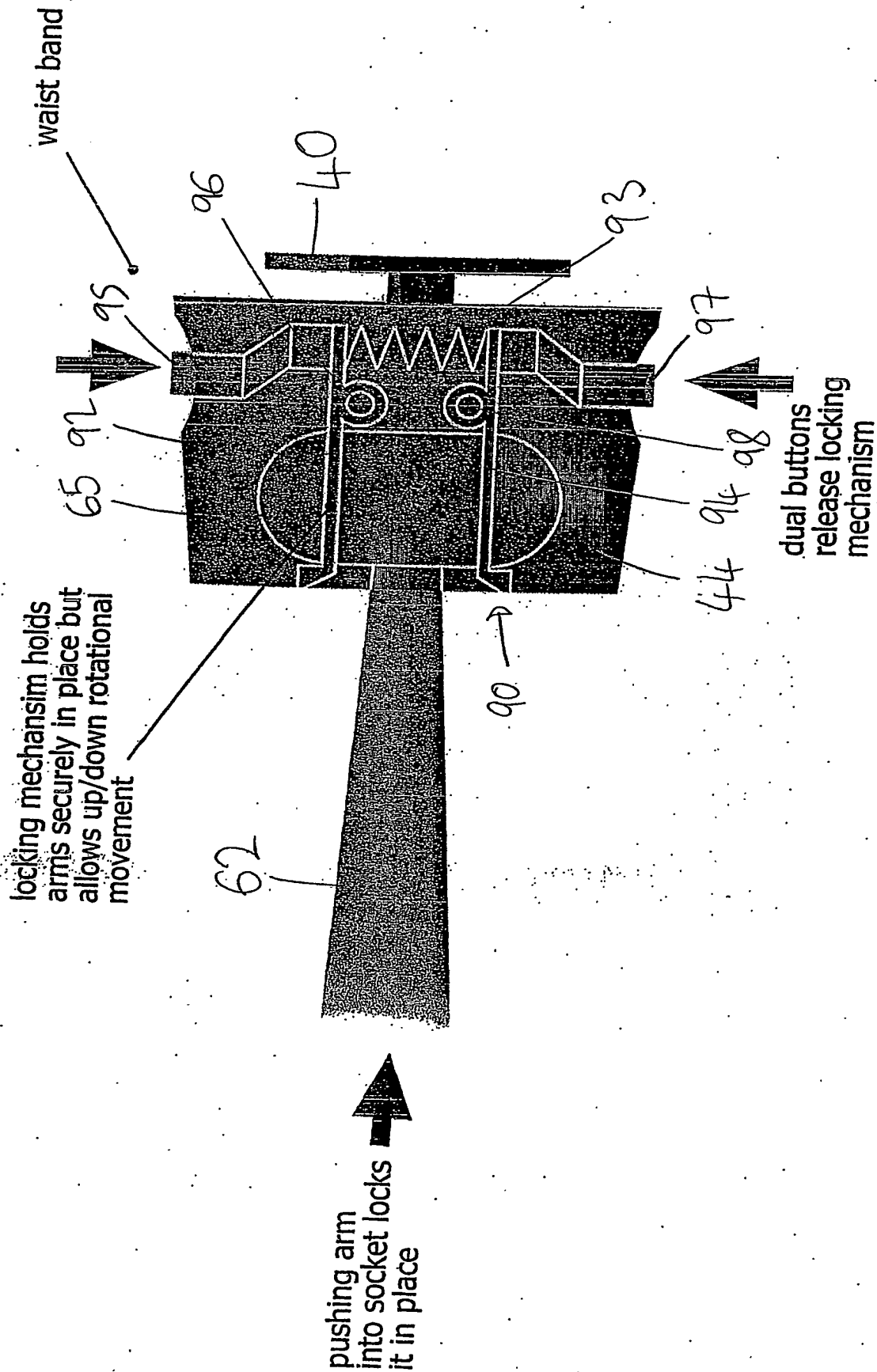
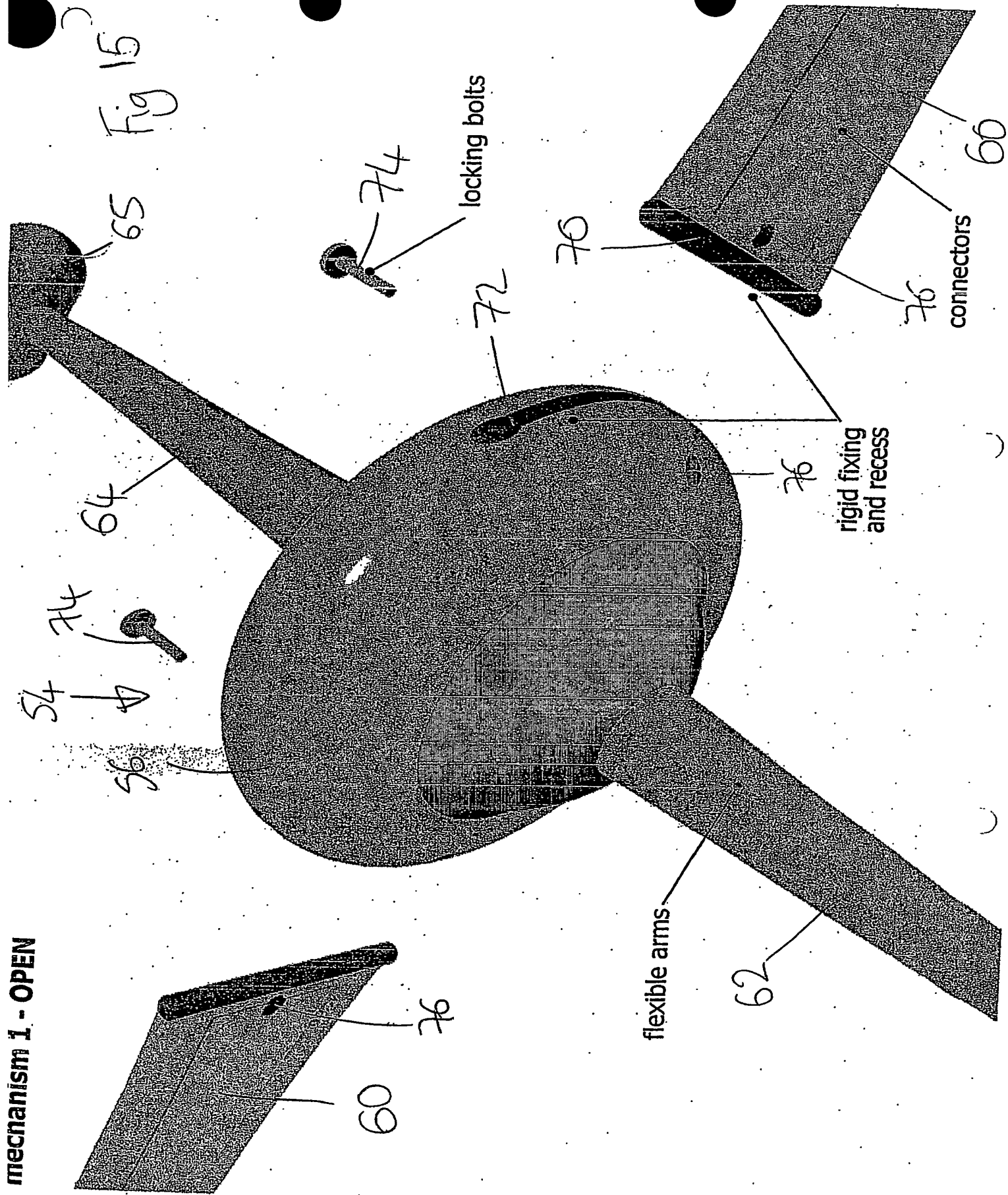
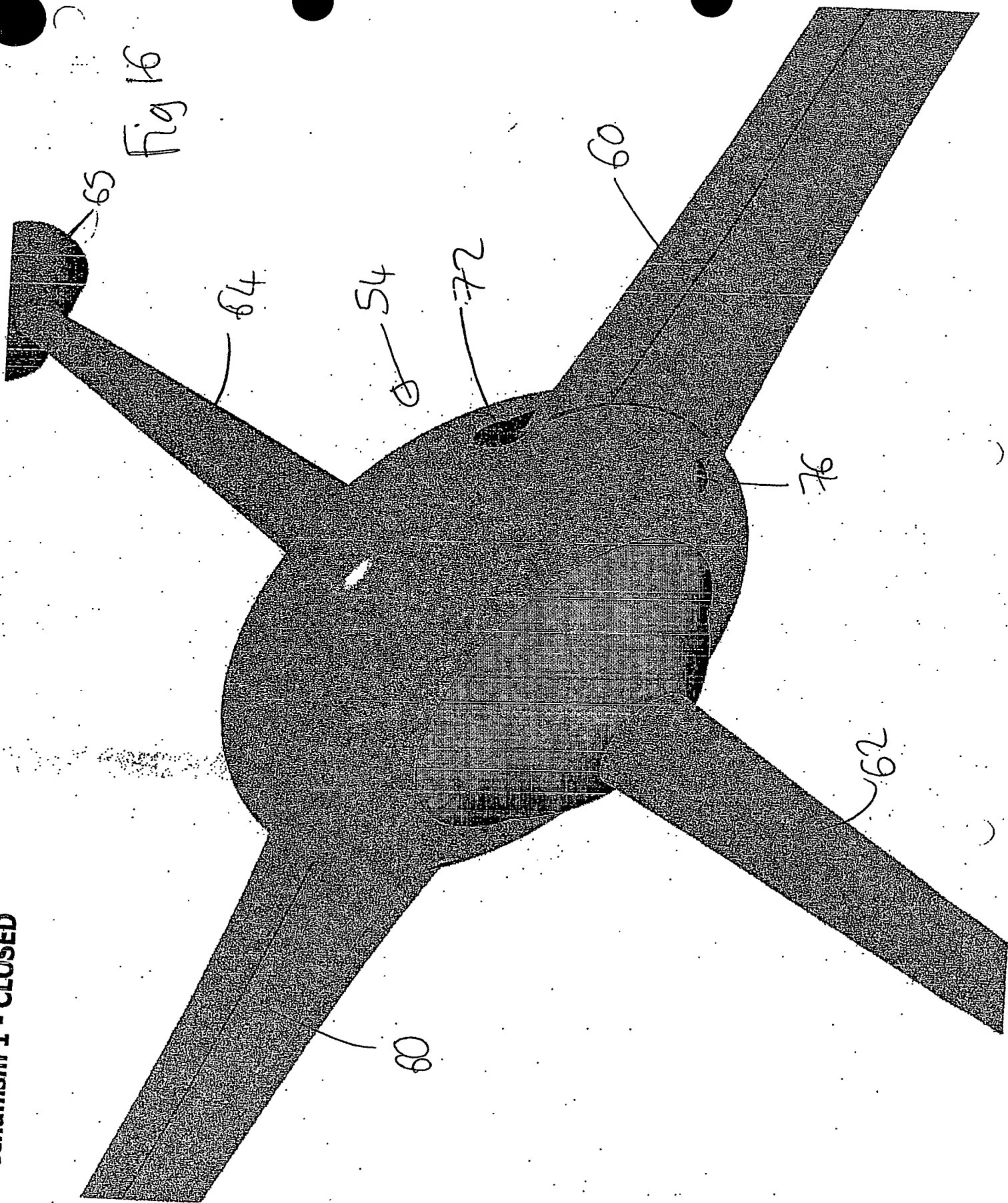


Fig 14



mechanism 1 - OPEN





mechanism 2 - OPEN

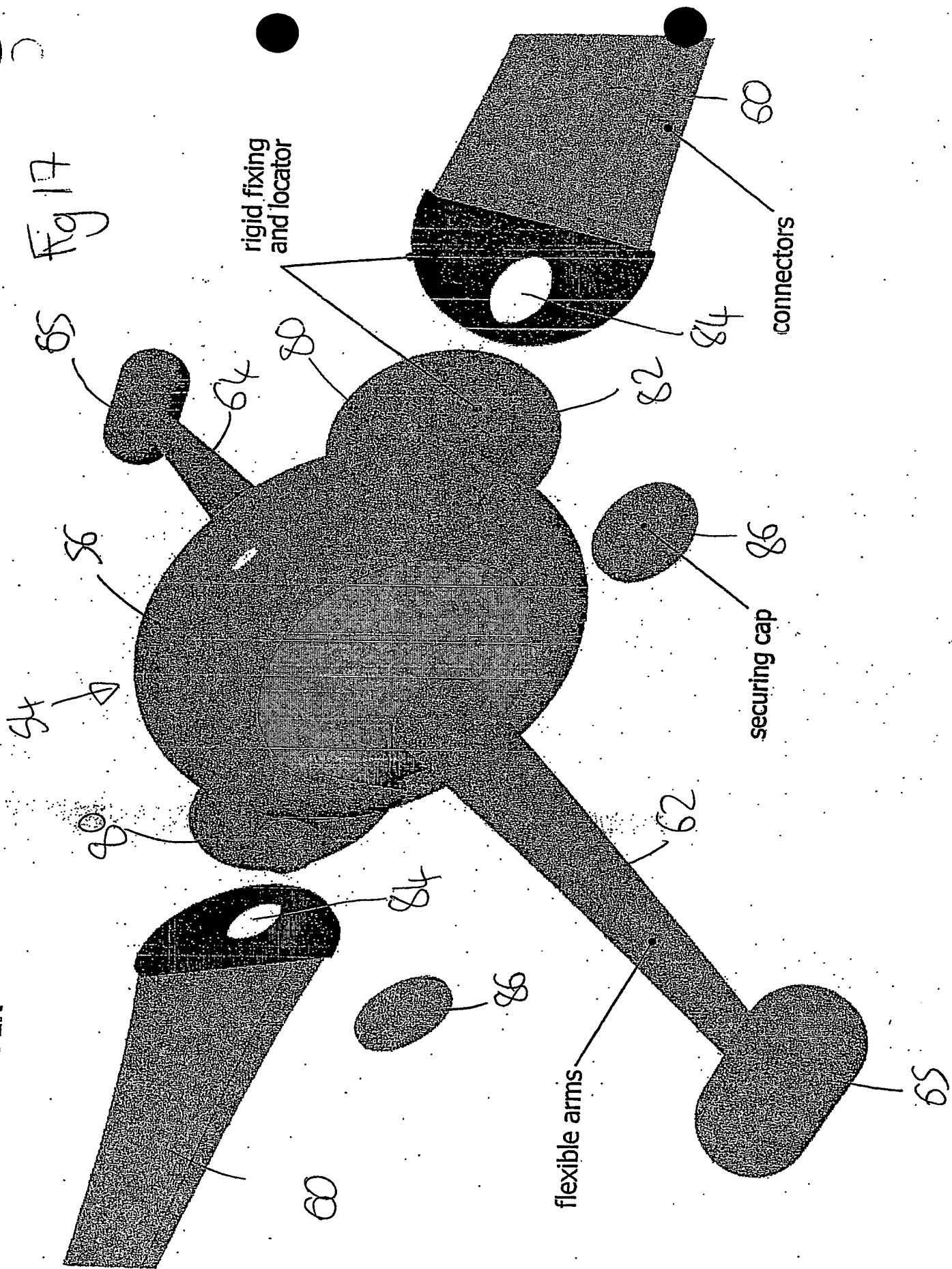
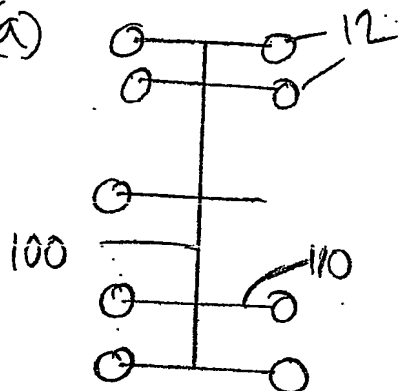


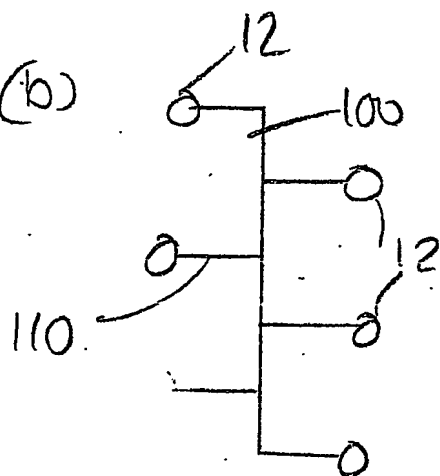


fig 19

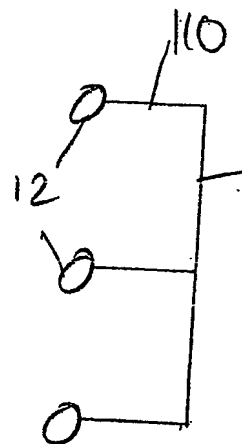
(a)



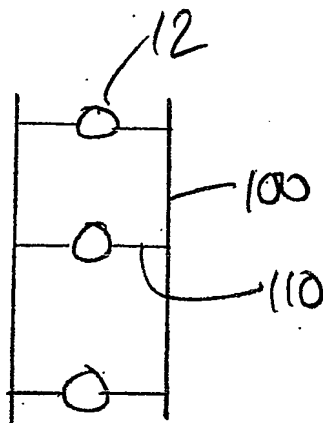
(b)



(c)



(d)



**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☒ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**